Alternatives and Justification Analysis Guide

Oil & Gas Facilities

1.0 Introduction

One of the goals of the Office of Coastal Management (OCM) is to achieve a balance between conservation of coastal resources and development of the coastal zone. Development in the coastal zone is encouraged but avoidance of unnecessary impacts to coastal resources is essential in order to protect those resources for future generations. To accomplish this goal, OCM reviews every Coastal Use Permit (CUP) application with the objective of avoiding and/or minimizing adverse impacts wherever possible. Pursuant to La. RS 49:214.27.B and C., OCM uses the Coastal Use Guidelines, found in LAC Title 43, Part I, Chapter 7, Subpart B, §701-719, to determine the type of information needed to fully evaluate a particular use and the adverse impacts that must be avoided to the maximum extent practicable. All coastal uses must be in conformance with all applicable Coastal Use Guidelines in order to receive approval from OCM.

Part of these guidelines, §701.H, charges OCM with ensuring that the public benefits of a proposed coastal use clearly outweigh any adverse impacts to public resources resulting from that use. **Public benefits** include providing goods and/or services to users that currently do not have reasonable access to such goods and/or services, increasing permanent employment opportunities and increasing public revenues. **Coastal resources** include coastal waters, wetlands, fisheries, wildlife and unique ecological/coastal features such as ridges, cheniers, salt domes, reefs, beaches and dunes. These resources provide value to the public in the form of storm and flood protection, nursery grounds for commercial and recreational fishing, critical habitat for endangered species and improved water quality. Public resources also include existing structures and infrastructure. **Adverse impacts** are direct or indirect loss and/or negative alteration of a public resource as well as negative impact on concurrent and neighboring coastal users and include such things as increased intensity or frequency of flooding, accelerated erosion and salt water intrusion.

Review of a proposed coastal use using the Coastal Use Guidelines includes asking questions such as:

1. Can adverse impacts from a proposed use on coastal resources and/or user groups be avoided by moving the use to an area which results in less adverse impact to coastal resources and/or users?
2. If the use cannot be moved, can demand for the proposed goods and/or services in the area to which they will be introduced be documented?
3. If a use cannot be moved and demand can be demonstrated, can the use be redesigned/reconfigured, or can different methods be used to accomplish the use, which results in less damage to coastal resources?

To answer these questions, OCM requires that the applicant provide Alternatives, Justification, Drainage and Coastal Hazard Analyses in sufficient detail to demonstrate a thorough consideration of the respective subjects. In an effort to recognize the differences between

small and large projects, and/or low and high coastal resource impact projects, OCM has developed a tiered approach to Analysis development. Factors such as, but not limited to, the complexity of the development, surrounding land use, type and level of resource impact and coastal use objective(s) are used to determine the range of alternatives to be considered in the Alternatives Analysis and the information and level of detail required for the Justification, Drainage and Coastal Hazard Analyses. This guide was developed to assist applicants for Coastal Use Permits with determining, in general, the type of information and level of detail needed to fully evaluate a proposed coastal use's potential impacts and benefits and therefore it's conformance with the Coastal Use Guidelines. Any combination of analyses may be required depending on the nature of the proposed coastal use and the potential adverse impacts that may occur from that use.

To fully evaluate a proposed coastal use's benefits and impacts, Alternatives and/or Justification Analyses are required during review of a use from which adverse impacts to coastal resources are, in OCM's opinion, likely to occur. The Alternatives Analysis should address several options for project siting that are compared equally for feasibility and will allow OCM to determine the least damaging feasible site for the proposed use. The Alternatives Analysis should provide documentation that clearly demonstrates that reasonable efforts were made to find less damaging sites and should provide an explanation for why each less damaging site was not feasible. The Alternatives Analysis also should address alternate site configuration, alternate methods of construction, and how adverse impacts to coastal resources will be minimized.

The Justification Analysis should include sufficient detail to clearly demonstrate demand for the proposed use and will allow OCM to determine the public need the proposed use. The Justification Analysis should explain the goods and/or services that the proposed coastal use will provide and include documentation that clearly demonstrates a public demand for, or public benefit resulting from, the proposed use. The analysis should provide enough information for OCM to determine that there is a reasonable chance that the project will be successful and not result in a situation where large scale destruction of resources is permitted for a project that fails economically, floods, causes flooding on adjacent areas or in some other way fails the public.

In general, the greater the resource or user group impacts, the more detail required for both the Alternatives and Justification Analyses. If reviewing this guide prior to submission of a JPA, the information presented herein should be taken into consideration and addressed while developing the project. In most cases, alternatives, or the lack thereof, are evident and a simple discussion of the options considered is sufficient. This information can be provided in steps 11b-c of the Joint Permit Application. If the information is not provided in or attached to the JPA, the OCM permit analyst will review the project and determine if any less damaging alternatives are evident. Additional information may be requested by the permit analyst in order to address the less damaging options he/she identified. Using the information contained in these analyses, OCM can effectively evaluate the proposed coastal use's conformance with the applicable Coastal Use Guidelines (specifically §701.F.3, 5, 7, 8, 10, 13, 16 and 19; §701.G.2 and 6; §701.H; §701.I; and all applicable Use Specific Guidelines).

Oil and Gas facilities located within the coastal zone of Louisiana include (for the purposes of this guide) well sites, production facilities and storage facilities. OCM is responsible for ensuring that energy development is supported but that unavoidable adverse impacts to

coastal resources are minimized to the maximum extent practicable. This guide addresses the Alternatives and Justification Analyses required for well sites, production facilities and storage facilities. Please refer to the Pipelines Guide for pipeline and pipeline related structure installation and the Industrial Guide for refinery development.

2.0 Well Sites

Well sites are located where the potential exists for extraction of oil, gas or other minerals from underground formations. This type of development is very common in the coastal zone of Louisiana and is subject to Coastal Use Permitting by OCM. The LA Department of Natural Resources (LDNR) Office of Conservation (OC) permits the drilling of the well. OCM permits those activities required to access the site and any site improvements necessary to access and/or facilitate drilling activities. Exploration of mineral resources for the purpose of energy production has been determined to be an issue of national significance and therefore considered justified. No further documentation to demonstrate public benefits is required.

An Alternative Analysis is required and is accomplished via the established Geologic Review (GR) process. Geologic Review will be required when a well site and/or access to that well site adversely impacts 0.25 or more acres of vegetated wetlands; adversely impacts other coastal resources; or includes project dimensions in excess of OCM established standards (see OCM Established Standards section below). Please note that the Louisiana Department of Wildlife and Fisheries (LDWF) can request a GR meeting for projects on oyster seed grounds if, in their opinion, impacts to oyster resources can be avoided through an alternatives review. Recommendations for avoiding or minimizing coastal resource impacts will be made at the meeting. It is then up to the applicant to adopt those recommendations or provide justification for an alternate plan. Follow-up GR meetings may be required depending on the recommendations made at the initial GR meeting. Impacts related to coastal hazards such as hurricanes, storm surge and flooding also should be addressed in order to minimize potential detrimental releases of pollutants.

2.1 Alternatives Analysis (Geologic Review Process)

The **Geologic Review** process involves a meeting at OCM's Baton Rouge office that involves structured question and answer sessions regarding the geology, engineering and siting of the proposed well. GR meetings can be held during the course of processing a Coastal Use Permit application or as a pre-application coordination effort. (To arrange a pre-application meeting, please contact our office at OCMinfo@la.gov or 800-267-4019.) Information is reviewed by an OCM contracted geology and engineering expert to determine the limitations of the drilling program and the range of alternative surface locations that could be used and still allow the objectives of the well to be achieved. The US Army Corps of Engineers (COE) and various resource agencies (LDWF, the Louisiana Department of Environmental Quality (DEQ), the Louisiana Coastal Protection and Restoration Authority (CPRA), the Louisiana Department of Culture, Recreation and Tourism (CRT), the US Fish and Wildlife Service (FWS), the National Oceanic and Atmospheric Administration (NOAA) Fisheries and the US Environmental Protection Agency (EPA)) are invited to this meeting and are given the opportunity to express their views regarding the siting of the well. The applicant should be represented by a person or persons familiar with the geology of the area to be explored and the engineering design of the proposed well. The following information is required for a

complete Geologic Review. Please note that missing or incomplete information may result in an incomplete review and require a follow-up meeting in order to present the missing or incomplete information.

2.1.1 General Information

- Name of the applicant
- Name(s) of operator(s), if not the applicant, including partners
- Name and location of the well
- Accurate, detailed location plats (normally these are the plats sent to the appropriate agencies before scheduling the meeting)
- Nature of the application (i.e. land/water location/access, dredging, filling, directional well, etc.)
- Dimensions of any dredging or filling
- Names and locations of any other permits held by the applicant in the area
- Aerial and/or ground photographs and/or imagery of the proposed site and access route(s)
- Status and/or soundings of proposed access routes
- Field trip data and site surveys that provide data about the proposed location; often the inclusion of site photography can avoid the necessity of a field trip to the site and the associated costs and delays.
- Future Plans - The best estimate of the applicant's future plans in the event of both the success and the failure of the well(s) in question. Include the need for possible pipelines and production facilities
- Economic Data - The overall project cost of the various available options to be considered can be a limiting factor for selection. If cost is a selection factor driving the choice of alternatives, cost comparisons (Authorizations for Expenditure, or AFEs) for all of the options considered will be required. The AFEs should include a detailed cost breakdown of the entire project for each option considered. These AFEs will be forwarded to our LGS contractor for review and comment. While not usually needed, detailed dry hole AFEs for the well as proposed and as suggested during the GR meeting may be required. The need for AFEs will be determined during the GR meeting and can be provided at a later date.
- Lease maps and lease information
- Spacing and unitization constraints
- Contractual obligations
- Any constraints (landowner restrictions, pipelines, houses, ditches, etc.) that may affect the proposed location

2.1.2 Geology Information

- Number of significant objectives
- Depth and expected contents
- Structure maps of all significant horizons
- Well logs of nearby wells (preferably correlated ones)
- Cross-sections relevant to the area
- Fault cuts
- Fault plane maps

- Isopach maps
- All significant seismic lines (with interpretations)
- Gas/oil/water contacts
- Shows and production of nearby wells in the same producing horizon
- The well's surface and bottomhole locations should be shown on all maps and the well path should be projected onto all cross-sections and seismic lines.

2.1.3 Engineering Information

- Total Vertical Depth (TVD) of the well
- Proposed mud program
- Proposed casing program
- Presence of depleted zones their depths and pressure readings
- Presence of overpressured zones and the depth(s) they begin
- Formation Pressure Gradient (FPG) and Formation Fracture Gradient (FFG) plots of nearby wells
- Well histories of wells in the area
- Directional history in the area
- Documentation to back up the presented well histories (i.e. mud recaps, drilling time, bit records, etc.).

All data, maps, cross-sections, aerial photos, images, and charts must be legible, clearly marked, and interpreted where appropriate. The proposed location's surface and bottomhole location (if different) should be clearly marked on each map, cross-section, seismic line, aerial photo, and image and each item should have its scale and orientation clearly shown. Details of ring levees, access roads, excavation and dredged material placement should be clearly shown. All plats and maps should be the same scale, if possible. Please be advised that all data presented at the meeting and left with OCM will be entered into a public record. Any proprietary information deemed necessary for complete Geologic Review should be presented at the meeting but not officially submitted to OCM for inclusion in the public record.

3.0 OCM Established Standards

OCM administers a series of General Permits (GPs) that cover a variety of commonly occurring activities that have predictable impacts. Development of these GPs, many of which are oil and gas related, have helped establish typical standard practices for the preparation of oil and gas exploration sites in water and on land. Projects that meet the specified criteria within the appropriate GP do not require public notice and generally experience expedited review and approval. The OCM GPs related to oil and gas exploration sites are GPs 5, 7, 10, 12, 15, 16, 19, 21, 25 and 26 and can be viewed at http://dnr.louisiana.gov/index.cfm?md=pagebuilder&tmp=home&pid=728. Oil and gas exploration projects that do not meet the applicable GP criteria may require Geologic Review to determine the need for the deviation from standard practices.

3.1 Water Location

Water locations involve the installation of a drilling barge, pile clusters, and a well protection structure; and possibly excavation for access. GPs 7, 10, 12, 15, 16, 19, 21 and 26 and apply

to water locations and outline the dimensions of slips, channels, canals and dredged material placement. In some cases, volume of material also is limited. In general, canals should be no wider that 70 feet and no deeper than 8 feet. Slips should be no more than 345 feet long by 160 feet wide by 8 feet deep with a 90 feet by 90 feet wing. Expansion of an existing slip cannot exceed 375 feet long by 120 feet wide by 8 feet deep with a 60 feet by 60 feet wing. Dredged material must be disposed of in an approved manner or used beneficially. In some cases, canal/channel length and/or dredged material placement are limited.

Barge foundation pads using approved materials may be used and should not exceed 250 feet long by 225 feet wide by 10 feet high or use more than 10,000 cubic yards of material. If the waterbottom elevation is less than -8 NGVD, the foundation pad cannot extend more than 1 foot above the waterbottom.

3.2 Land Location

Land locations involve the construction of an earthen ring levee around the proposed well site. GP 5, 19 and 25 applies to ring levees and outlines the dimensions of the ring levee and the access road, if needed. In general, ring levees should be no larger than 300 feet by 300 feet, or 90,000 square feet. Fill material must be clean and excavated from within the ring levee or hauled in from offsite.

Access roads should be no wider than 40 feet at the base (toe to toe) and no more than 5 feet above mean sea level, or three (3) feet above adjacent ground, whichever is less. Borrow pits for road fill shall be a maximum of 300 feet long by 30 feet wide (at surface) with the lip of the borrow pit no more than 20 feet from the toe of the road bed. Borrow pits should be staggered on alternating sides of the road when practical, and when not practical shall have 50 foot gaps between pits. Culverts shall be installed through the road bed at appropriate intervals to handle surface water flow but should be installed at least every 250 feet and at the crossing of any creeks, streams, sloughs, and other water bodies. Culverts shall provide a minimum of 452 square inches of cross-sectional flow area, but must be of sufficient size to convey normal flows. Culverts shall be installed at elevations to approximate pre-project flow conditions and shall not be installed to promote the drainage of wetlands or to impede wetland flooding. At no time shall culverts be placed to connect one borrow pit to another.

4.0 Production and Above Ground Storage Facilities

Oil and gas related production facilities addressed in this guide include tank batteries, production barges, heater platforms, separator platforms, flare platforms and compressor stations. Production of mineral resources for the purpose of energy production has been determined to be an issue of national significance and therefore considered justified. No further justification for production facilities is required.

An Alternatives Analysis is required when, in OCM's opinion, adverse impacts to coastal resources may occur and should include a review of all feasible sites within the field being produced. The goal of an alternatives analysis is to find a location for the proposed facility that results in the least amount of adverse impact to coastal resources while allowing the objectives of the project to be met. **Feasible sites** are defined as any parcel of land within the field being produced that that can support the main objective(s) of the facility. Feasible sites can be

identified using current aerial photography to find currently developed areas and contacting landowners to determine availability for purchase or lease. Local newspapers also provide a source of available real estate offerings. A drive-by search for parcels posted for sale or lease in the field to be produced also can be an effective method of finding available sites. Several websites offer listings of large tracts of land (see "Available Sources" below). Existing infrastructure (access roads, utilities) should be reviewed to determine if adequate to support the proposed facility. The route of potential pipelines also should be considered when selecting a production facility site. Impacts related to coastal hazards such as hurricanes, tornadoes, storm surge, flooding, sea level rise and subsidence also should be addressed in order to minimize potential detrimental releases of pollutants (see Drainage and Coastal Hazards guide for more information).

4.1 Alternatives Analysis

All feasible sites should be considered. OCM reserves the right to suggest consideration of other sites not identified by the applicant. The following information should be included in the Alternatives Analysis:

1. Define the project objective(s) and identify the proposed features required to meet the objective(s). Identify any project objectives that may limit the range of alternatives to be considered, including anticipated future plans in the field that may limit the location of the facility.

2. Identify, on a map, the location of each site considered. If no available alternate sites were found, please explain why and provide documentation demonstrating the efforts taken to find alternate sites. If no efforts were undertaken to find alternate sites, provide an explanation of why not.

3. Describe each site considered. Include parcel size relative to project size, general topography and water/wetland features, habitat type(s) present, if known, and estimate of impact to each. If access to the property is limited or unavailable, explain the limitations and provide any information that can be gained about the site using current photography and topographic and habitat maps. Identify any limiting factors and explain how those factors limit development.

4. Identify the infrastructure needs of the facility and the availability and capacity of existing infrastructure (roads, utilities, water, sewer, etc.) at each site. Describe any new infrastructure required to service the facility

5. Describe the surrounding land use within one (1) mile of each site considered. Radius should extend from the outside boundaries of the proposed project. Include type and extent of existing use and any planned future uses, if known.

6. Provide a narrative explaining the reasons for the elimination of each site considered but not selected. Please note that the factors used to compare each site should be identified and should be consistent among sites.

OCM encourages applicants to hold pre-application consultation meetings with the regulatory and resource agencies in order to identify the least damaging feasible site for development of

the production facility. To arrange a pre-application meeting, please contact our office at OCMinfo@la.gov or 800-267-4019.

5.0 Underground Storage Facilities

Oil & Gas storage facilities involve the long term storage of oil and gas products for the purpose of providing the Strategic National Petroleum Reserves. In coastal Louisiana, salt domes are the feature most commonly used for large scale storage of oil & gas products. The use of salt domes as storage facilities is regulated by the Federal Energy Regulatory Commission (FERC) and the LA DNR Office of Conservation. OCM is not involved in the permitting of the salt dome for use as a storage facility. It is OCM's responsibility to minimize adverse impacts to coastal resources resulting from improvements needed to construct the injection well sites and the install the pipelines needed to service the facility. OCM also is responsible for reviewing the source and/or salinity of any surface or ground water used to solution mine the dome to facilitate storage capabilities, and the fate of any waste water generated during solution mining. Storage of energy resources has been determined to be an issue of national significance and therefore considered justified. No further justification for the need for large scale oil & gas storage facilities is required.

An Alternative Site Analysis, however, is required for the siting of well locations and the routing of pipelines and should follow the recommendations made in the applicable Alternatives and Justification Analyses Guides. A Geologic Review meeting may be necessary for the siting of the wells. OCM encourages applicants to hold pre-application consultation meetings with the regulatory and resource agencies in order to identify the least damaging feasible options for development of the storage facility. To arrange a pre-application meeting, please contact our office at OCMinfo@la.gov or 800-267-4019.

6.0 Available Sources

For more information regarding the Geologic Review process, please visit the LGS website at http://www.lgs.lsu.edu/deploy/content/GEORV/index.php.

The following websites may be useful in identifying possible alternate sites for production facilities:

http://louisianalandsource.com/
http://www.westslopeproperties.com/land_sale/?filter=LA
http://www.landwatch.com/Louisiana_land_for_sale
http://www.landandfarm.com/
http://www.landsofamerica.com/america/?Search=region
http://www.unitedcountry.com/realestate/search-state/index.htm
http://www.farmlandsearch.com/view.aspx?sc=louisiana&p=0-8-0
http://www.wredcoland.com/Default
http://www.ldaf.state.la.us/portal/News/MarketBulletinCurrent/tabid/165/Default.aspx